
it, this is how the aim of machine learning is achieved. Deep learning is a machine learning technique that helps with the neural networks. Example applications include pattern recognition, email filtering, optical character recognition, computer vision, etc. ML definitely has a lot to offer in the fields of software, health, financial services, manufacturing, education, transportation, media, etc. It helps these industries by helping them identify profitable opportunities and avoiding risks. It definitely has a great scope of scalability in the near future that will help boost the standard of living at a faster pace. It is an area of technology that will eliminate redundant human work which will in turn require to turn our minds on, on newer technology. There still is a huge amount of research work taking place in this domain and there certainly is great future in the field of ML.

APPLICATIONS OF MACHINE LEARNING:

Machine Learning (ML) being one of the application of Artificial Intelligence (AI), has its own Applications. Some of them are

1. VIRTUAL PERSONAL ASSISTANTS:

Siri, Alexa, Google Now are the best examples of Virtual Personal Assistants. As the name suggests they assist you in finding information. Machine learning is an important part of these personal assistants as they collect and refine the information on the basis of your previous involvement with them. Later, this set of data is utilized to provide results that are tailored to your preferences.

2. PREDICTIONS:

I. Traffic Prediction:

We all have been using GPS navigation services. While we do that, our current locations and velocities are being saved at a central server for managing traffic. This data is then used to build a map of current traffic. While this helps in preventing the traffic and does congestion analysis, the underlying problem is that there are less number of cars that are equipped with GPS. Machine learning in such scenarios helps to estimate the regions where congestion can be found on the basis of daily experiences.

II. Disease Prediction:

Based on the previously available data and making use of the ML algorithms, the occurrence of the disease can be predicted for the new data of the new person.

3. EMAIL SPAM AND MALWARE FILTERING:

There are a number of spam filtering approaches that email clients use. To ascertain that these spam filters are continuously updated, they are powered by machine learning. When rule-based spam filtering is done, it fails to track the latest tricks adopted by spammers. Multi-Layer Perceptron, C 4.5 Decision Tree Induction are some of the spam filtering techniques that are powered by ML.

The system security programs that are powered by machine learning understand the coding pattern. Therefore, they detect new malware with 2–10% variation easily and offer protection against them.

4. PRODUCT RECOMMENDATIONS:

Based on the products you have bought previously or the products you have liked or the products the you have to the cart, new products will be recommended based on your previous preferences.

5. RETAIL:

Machine learning in retail is more than just a latest trend, retailers are implementing big data technologies like Hadoop and Spark to build big data solutions and quickly realizing the fact that it's only the start. They need a solution which can analyse the data in real-time and provide valuable insights that can translate into tangible

outcomes like repeat purchasing. Machine learning algorithms process this data intelligently and automate the analysis.

6. FINANCE FOR FRAUD DETECTION:

One of the core machine learning use cases in banking/finance domain is to combat fraud. Machine learning is best suited for this use case as it can scan through huge amounts of transactional data and identify if there is any unusual behaviour. Every transaction a customer makes is analysed in real-time and given a fraud-score that represents the likelihood of the transaction being fraudulent. If the fraud score is above a particular threshold, a rejection will be triggered automatically which would otherwise be difficult without the application of machine learning techniques as humans cannot reviews 1000's of data points in seconds and make a decision.

7. SEARCH ENGINE RESULT REFINING:

Google and other search engines use machine learning to improve the search results for you. Every time you execute a search, the algorithms at the backend keep a watch at how you respond to the results. If you open the top results and stay on the web page for long, the search engine assumes that the results it displayed were in accordance to the query. Similarly, if you reach the second or third page of the search results but do not open any of the results, the search engine estimates that the results served did not match requirement. This way, the algorithms working at the backend improve the search results.

CHALLENGES:

1. OBJECT DETECTION:

It is currently hard for algorithms to pick out objects. Image classification and localization is still a very challenging field in computer vision and machine learning.

2. ATTENTION:

Attention can be used in neural networks though it is not solved yet, it is important to make good use of computation resources. Basically attention is about focusing on smaller chunk of input stimuli at a time and then integrating the results at the end. For example, Human visual system.

3. VIDEO TRAINING DATA:

We have been using static images for long enough now. We can build machine learning systems that learn by observation and listening as there are important cues in video that can obviously aid learning.

4. MEDICAL DIAGNOSIS:

Given the symptoms exhibited in a patient and a database of patient records, predict whether the patient is likely to have an illness. A model of this decision problem could be used by a program to provide decision support to medical professionals.

5. CUSTOMER SEGMENTATION:

Given the pattern of behavior by a user during a trial period and the past behavior of all users, identify those users that will convert to the paid version of the product and those that will not. A model of this decision problem would allow a program to trigger customer intervention.

6. MEMORY NETWORKS:

Memory networks are type of neural network hooked up to a memory block that can be read and written to by the network. We can find better ways for such networks to discover facts, store and use them effectively to solve problems.

7. ONE-SHOT LEARNING:

We still haven't been able to achieve one shot learning. Traditional gradient based networks need an enormous amount of data to learn and this is often in the form of extensive iterative training. Hence, we can find a way to enable neural networks to learn using just one or few examples.

8.DEMOCRATIZING ARTIFICIAL INTELLIGENCE:

AI is still not complete democratized with big data and computer power. If we can do this, we will have the significant intelligence required to take on the world's problems head on.

RELATIONSHIP WITH OTHER FIELDS:

Due to its association with data, ML is sometimes blended with Data Mining and Statistics. It is also related to Mathematical Optimization which in turn helps ML to focus on the correct set of data.

CONCLUSION:

According to KellyOCG India, demand for Artificial Intelligence and Machine Learning specialists in the country is expected to see 60% rise by 2018 due to increasing adoption of automation.

Machine learning enables analysis of large amount of data. While it generally delivers faster, more accurate results in order to identify profitable results. Combining ML with AI and cognitive technology can make it even more effective in processing large volumes of information.



Fig 2: Image

Current developments in machine learning are primarily focused on revamping neural networks. Researchers believe that by streamlining neural networks it would be possible for machines to mimic human learning processes. These new learning frameworks can be extremely powerful tools and they have the ability to dramatically transform any industry.

The field of ML is constantly achieving new breakthroughs every day and it has the potential to completely revolutionize our future. With the rapidly increasing scope of machine learning, it has become the powerful tool and promises to grow well in future.